

Amendments to the Claims

The following Listing of Claims replaces all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (original): A method of generating a graphical bar code, comprising: applying an invertible graphical operation between regions of a base image and information-encoding graphical templates selected from a predefined template set to produce a graphical bar code with regions from which graphical templates are recoverable by applying an inverse graphical operation between graphical bar code regions and corresponding base image regions.

Claim 2 (original): The method of claim 1, wherein the invertible graphical operation corresponds to an exclusive OR (XOR) operation.

Claim 3 (original): The method of claim 2, further comprising applying XOR operations between the graphical bar code regions and corresponding base image regions to produce the graphical templates.

Claim 4 (previously presented): The method of claim 1, wherein each of the base image regions and the graphical templates has a same number of pixels.

Claim 5 (original): The method of claim 4, wherein each of the base image regions and the graphical templates has a common pixel layout.

Claim 6 (original): The method of claim 5, wherein the common pixel layout corresponds to a rectangular pixel array.

Claim 7 (original): The method of claim 1, wherein each graphical template comprises a pattern of bright and dark pixels.

Claim 8 (original): The method of claim 7, wherein the number of bright pixels is greater than the number of dark pixels.

Claim 9 (original): The method of claim 7, wherein each pixel location within the predefined template set has an equal probability of being a dark pixel.

Claim 10 (currently amended): The method of claim 1, wherein the invertible graphical operation is applied between an ordered sequence of base image regions and a sequence of graphical templates are ordered to substantially preserve local dark dot density uniformity across a concatenation of the ordered sequence of graphical templates adaptively in accordance with one or more predefined rules relating to disfavored graphical template sequences.

Claim 11 (original): A computer program residing on a computer-readable medium and comprising computer-readable instructions for causing a computer to:

apply an invertible graphical operation between regions of a base image and information-encoding graphical templates selected from a predefined template set to produce a graphical bar code with regions from which graphical templates are recoverable by applying an inverse graphical operation between graphical bar code regions and corresponding base image regions.

Claim 12 (original): A method of decoding a graphical bar code, comprising:
applying an invertible graphical operation between regions of a graphical bar code and corresponding regions of a base image to produce a set of measurement blocks; and
selecting from a predefined template set information-encoding graphical templates corresponding to the set of measurement blocks with the highest estimated probability.

Claim 13 (original): The method of claim 12, wherein the invertible graphical operation corresponds to an XOR operation.

Claim 14 (original): The method of claim 12, further comprising computing pixel value probabilities for each of the measurement blocks.

Claim 15 (original): The method of claim 14, wherein pixel value probabilities are computed for a given measurement block based upon a weighted average of gray value measurements over the given measurement block.

Claim 16 (previously presented): The method of claim 15, wherein the weighted average of gray values is computed by fitting a mask to dot locations over the given measurement block.

Claim 17 (original): The method of claim 16, wherein the mask has a truncated Gaussian profile.

Claim 18 (original): The method of claim 15, further comprising estimating parameters of probability distributions fit to a histogram of the weighted average of gray value measurements.

Claim 19 (original): The method of claim 18, wherein the probability distributions are asymmetric Laplacian distributions.

Claim 20 (original): A computer program residing on a computer-readable medium and comprising computer-readable instructions for causing a computer to:

apply an invertible graphical operation between regions of a graphical bar code and corresponding regions of a base image to produce a set of measurement blocks; and

select from a predefined template set information-encoding graphical templates corresponding to the set of measurement blocks with the highest estimated probability.

Claim 21 (new): The method of claim 1, wherein the invertible graphical operation is applied between respective sub-regions of the base image and respective graphical templates.

Claim 22 (new): The method of claim 21, wherein the invertible graphical operation is applied between a predetermined sequence of base image sub-regions and an information-encoding sequence of graphical templates.

Claim 23 (new): The method of claim 22, wherein the information-encoding sequence of graphical templates is recoverable by applying the inverse graphical operation between respective sub-regions of the graphical bar code and respective sub-regions of the base image ordered in accordance with the predetermined base image sub-region sequence.